

Land Warrior-Stryker Interoperable Risk Reduction Strategies

COL Theodore E. Johnson and LTC David L. Gallop



The technology to provide soldiers with integrated and modular ensembles that offer unprecedented lethality by leveraging networked information has existed since the early 1990s. Integrating the technology has been difficult. The most recent attempt was Land Warrior-Initial Capability (LW-IC). LW-IC was unable to meet reliability requirements during developmental testing because hardening commercial hardware and software — while balancing functionality, space, weight, power and balance requirements — was extremely difficult. As Land Warrior moves forward into the development of Land Warrior-Stryker Interoperable (LW-SI), the program is incorporating lessons from the LW-IC failures and applying risk reduction techniques to product development.

LW-SI will be developed and tested in small, manageable bites. For example, one challenging requirement for LW-SI is the integration of a laser and radio frequency (Laser-RF)-based combat identification system. The LW-SI risk reduction strategy is to integrate existing Laser-RF technology into LW-IC ensembles to identify and isolate the technical difficulties early (within 7 months after contract award).

Another high-risk requirement is integration of networking, communications and power within the 10 Stryker configurations through a Land Warrior Vehicle Interface Kit (VIK). Rather than develop an operational requirements document-compliant VIK over a 3-year period and identifying real-world problems weeks before formal test, LW-SI will develop and test a Prototype VIK (Proto-VIK). Proto-VIK's objective is to force Land Warrior and Stryker engineers to work together inside the vehicle to deliver a functioning product prior to critical design review. The Proto-VIK will only pro-

vide a small fraction of the required capability but exercises the necessary engineering and organizational coordination to validate design assumptions.

Test Exerciser

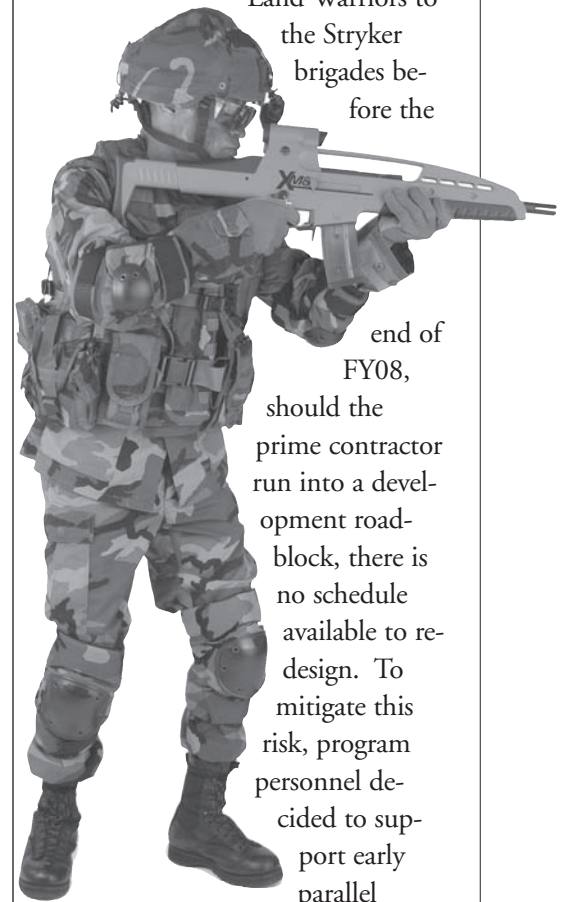
Land Warrior is developing a handheld leader planning tool — the Commander's Digital Assistant (CDA). The CDA uses Army standard hardware and hosts Land Warrior software. Since the hardware is fully mature, the CDA serves as a stable host to exercise Land Warrior command, control and communications (C3) functions. The CDA can provide real-world information on wireless network capacity, message formatting, graphic user interfaces and supportability. The CDA facilitates low-cost Land Warrior analogous information.

The 82nd Airborne Division used CDAs in Iraq. Their feedback on planning and communications requirements applies directly to LW-SI risk reduction. Having the ability to exercise hundreds of CDAs provides insights to LW-SI

supportability. Those insights feed the LW-SI detailed design.

Early Parallel Development Paths

Given the HQDA mandate to field Land Warriors to the Stryker brigades before the



end of FY08, should the prime contractor run into a development roadblock, there is no schedule available to redesign. To mitigate this risk, program personnel decided to support early parallel

development paths for the most challenging requirements — power, voice control, collaborative planning, weight reduction and combat identification. The program office is exploiting technology base expertise at the Army Research and Development Center at Fort Monmouth, NJ, for these parallel paths. This allows the prime contractor, who has total systems integration responsibility, to focus on the primary development path and monitor parallel path progress. The prime contractor, using the systems engineering and integrated product and process development processes will determine if, when and what efforts from the parallel paths will migrate to the primary path.

The parallel path efforts begin after system preliminary design review and last approximately 9 months. Each of the paths results in a prototype demonstration prior to system critical design review in the third quarter of FY04.

Risk Reduction Relationships

The internal LW-SI program risk reduction efforts support a lower risk development of the Land Warrior Advanced Capability (LW-AC) program. LW-AC is the revolutionary capability plan of the Objective Force unit of action (UA). Both the LW-AC and LW-SI programs take advantage of technologies matured under the Objective Force Warrior Advanced Technology Demonstration (OFW ATD). The OFW ATD will feed LW-SI evolutionary improvements as early as FY06 and provide a foundation for revolutionary improvements for LW-AC.

The Army restructured the Land Warrior program in FY03 to facilitate a lower risk approach that follows a build a little, test a little approach. The program will exploit the CDA as model for Land Warrior to get real world, analogous data on C3 and supportability immediately. Early, short-duration parallel development paths yielding working

prototypes mitigate some of the riskier technologies. Close coordination between the OFW ATD and Land Warrior programs will reduce the risk of fielding LW-AC to the UA and reduce the risk that LW-SI capabilities will become obsolete.

COL THEODORE E. JOHNSON is the U.S. Army's Project Manager Soldier Warrior. He has a B.A. in psychology from Upsala College, an M.S. in international relations from Troy State University and an M.S. in national resource strategy from the Industrial College of the Armed Forces, where he was a distinguished graduate.

LTC DAVID L. GALLOP is the U.S. Army's Product Manager Land Warrior. He has both an M.S. in aeronautics and M.B.A. from Florida Institute of Technology and is a graduate of the U.S. Army Command and General Staff College. Gallop brings more than 10 years of system acquisition experience to Land Warrior and is a member of the International Council of Systems Engineers.

Defining the Objective Force Soldier: TRADOC and the Objective Force Warrior Advanced Technology Demonstration

MAJ Marco J. Barrera and CPT Vincent Grizio



"Soldiers are the centerpiece of our formations."

The Army Vision

Defining the soldier concepts and requirements within the Objective Force (OF) is a daunting task. However, the U.S. Army Training and Doctrine Command (TRADOC) and the science and technology (S&T) community are in close partnership to help provide the answers. In fact, TRADOC and the Army Natick Soldier Center have been working together since the early planning of the Objective Force Warrior (OFW) Advanced Technology Demonstration (ATD) 2 years ago when both communities participated in developing the ATD's exit criteria. Through the OFW ATD, TRADOC, the S&T community and industry are set to refine the soldier operational concepts and user requirements and, ultimately, conduct a technology demonstration that provides the answers to the operational requirements for the OF soldier.